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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/519,473	12/29/2004	Tetsuya Kamihara	040302-0427	2688
23428 7590 08/07/2009 FOLEY AND LARDNER LLP SUITE 500 3000 K STREET NW WASHINGTON, DC 20007				
EXAMINER				
ESSEX, STEPHAN J				
ART UNIT		PAPER NUMBER		
1795				
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary

Application No.

10/519,473

Applicant(s)

KAMIHARA, TETSUYA

Examiner

STEPHAN ESSEX

Art Unit

1795

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 18 May 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 and 3-25 is/are pending in the application.
- 4a) Of the above claim(s) 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1, 3-12 and 14-25 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12/29/2004 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB-08)
Paper No(s)/Mail Date _____

- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

DETAILED ACTION

1. The applicant's request for reconsideration filed on May 18, 2009 was received. A 37 CFR 1.131 declaration filed on May 18, 2009 was received. New claims 14-25 were added.
2. The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Specification

3. The following title is suggested: FUEL CELL SYTEM WITH RECIRCULATION SYSTEM AND PURGE VALVE.

This may result in a slightly longer title, but the loss in brevity of title will be more than offset by the gain in its informative value in indexing, classifying, searching, etc. (see MPEP § 606.01).

Claim Rejections - 35 USC § 102

4. Claims 1, 3-6, 9, 10, 14-19, 22 and 23 are rejected under 35 U.S.C. 102(b) as being anticipated by Andreoli et al. (hereinafter "Andreoli") (U.S. Pat. No. 5,605,770).

Regarding claims 1, 4, 5, 9, 10, 14, 17 18, 22 and 23, Andreoli teaches a fuel cell system which includes a fuel cell constituted by a plurality of units **1, 2**, a subsystem for the supply of hydrogen comprising a delivery line **9** (supply system), which supplies the anodes of the fuel cell through a control valve **12** (fuel pressure regulator) and a primary

manifold **13** (supply system), and a main discharge manifold **20**. The valve **12** is controlled jointly by a pressure sensor **13** and a signal generated by a central processing unit **15** (controller) which governs the whole system by means of suitable signals. Temperature sensors **17**, **117**, a pressure sensor **14** and a flow sensor **19** on the manifold **13**, the supply line **11** and at the outlet of the cell provide the central processing unit **15** with information which is used in the control of the system. The main discharge manifold **20** is connected to a valve **22** (purge valve) for discharging exhaust gases and a fan **23** (recirculation system) for recycling any hydrogen in excess of the stoichiometric quantity and not consumed the cell (see col. 3, lines 19-63).

Andreoli is silent to a valve opening sensor. However, it is the position of the examiner that a valve opening sensor is inherent, given that the central processing unit **15** must operate the opening and closing of the control valve **12** (see col. 3, lines 41-45). A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. See *In re Robertson*, 49 USPQ2d 1949 (1999).

Although Andreoli is silent to the central processing unit **15** adjusting the opening of a purge valve to maintain a flow rate of fuel in the fuel gas passing through the purge valve at a threshold set in accordance with operation conditions of the fuel cell system, Andreoli teaches that the central control unit **15** controls the operation of the fuel cell based on the pressure and flow rate information received from pressure sensor **14** and flow sensor **19** and would therefore be capable of performing the claimed function (see

col. 3, lines 47-50; figure 1). Furthermore, the cited prior art teaches all of the positively recited structure of the claimed apparatus. The courts have held that apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. See *In re Danley*, 120 USPQ 528, 531 (CCPA 1959); and *Hewlett Packard Co. V. Bausch and Lomb, Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (see MPEP §§ 2114 and 2173.05(g)).

Regarding claims 3, 6, 15, 16 and 19, the cited prior art teaches all of the positively recited structure of the claimed apparatus. The courts have held that apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. See *In re Danley*, 120 USPQ 528, 531 (CCPA 1959); and *Hewlett Packard Co. V. Bausch and Lomb, Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (see MPEP §§ 2114 and 2173.05(g)).

Claim Rejections - 35 USC § 103

5. The claim rejections as being unpatentable over Simpson et al. (U.S. Pat. No. 2004/0161657) on claims 1 and 3-13 are withdrawn because the declaration filed on May 18, 2009 under 37 CFR 1.131 is sufficient to overcome the reference.
6. Claims 1, 3, 5-7, 9, 14-16, 18, 19, 20 and 22 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao (JP2002-151116; see English machine-translation) in view of Epp et al. (hereinafter "Epp") (U.S. Pat. No. 6,063,515).

Regarding claims 1 and 14 Nakao teaches a fuel cell system comprising a feeding passage **11** (supply system) supplied to a fuel cell stack **6**, a cycle channel **13** (recirculation system) which circulates through the hydrogen gas discharged from the fuel cell stack **6** to an ejector pump **3**. A system controller **7** controls these parts (see paragraphs 25 and 27; figures 1 and 3).

Nakao is silent to a purge valve contained in the fuel gas recirculation system.

Epp teaches a fuel cell electric power generation system **300** having a fuel recirculation loop **322** (recirculation system) provided with a purge valve **391** (see col. 8, lines 50-52; col. 10, lines 27-29; figure 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a purge valve in the cycle channel of Nakao because Epp teaches the use of the purge valve to allow the relief of pressure within the cycle channel.

Although Nakao is silent to the controller **7** adjusting the opening of a purge valve to maintain a flow rate of fuel in the fuel gas passing through the purge valve at a threshold set in accordance with operation conditions of the fuel cell system, Nakao teaches that the controller **7** controls the operation of the fuel cell based on the pressure and flow rate of the reactant gasses and would therefore be capable of performing the claimed function (see paragraphs 33 and 49). Furthermore, the cited prior art teaches all of the positively recited structure of the claimed apparatus. The courts have held that apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. See *In re Danley*, 120 USPQ 528, 531 (CCPA 1959); and *Hewlett Packard*

Co. V. Bausch and Lomb, Inc., 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (see MPEP §§ 2114 and 2173.05(g)).

Regarding claims 3, 6, 15, 16 and 19, the cited prior art teaches all of the positively recited structure of the claimed apparatus. The courts have held that apparatus claims must be structurally distinguishable from the prior art in terms of structure, not function. See *In re Danley*, 120 USPQ 528, 531 (CCPA 1959); and *Hewlett Packard Co. V. Bausch and Lomb, Inc.*, 15 USPQ2d 1525, 1528 (Fed. Cir. 1990) (see MPEP §§ 2114 and 2173.05(g)).

Regarding claims 5 and 18, Nakao teaches a pressure sensor 5 which detects the pressure of the hydrogen gas supplied to the fuel cell stack 6 (see paragraph 25; figures 1 and 3).

Regarding claims 7 and 20, Nakao teaches an ejector pump 3, but is silent to a pressure sensor for detecting a supply pressure of fuel gas supplied to the ejector.

Epp teaches a pressure sensor 363 disposed upstream of a fuel knock-out drum 326 (ejector). The rate of supply of process fluid to a vaporizer may be adjusted responsive to an output of the pressure sensor 363 (see col. 6, lines 44-48; col. 10, lines 29-39; figure 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have provided a pressure sensor before the ejector of Nakao because Epp teaches that it enables the pressure of the fuel gas to be controlled.

Regarding claims 9 and 22, Nakao teaches a regulator valve 2 which adjusts the pressure of the hydrogen gas from the stored fuel storage cylinder 1 and a pressure

sensor **5** which detects the pressure of the hydrogen gas supplied to the fuel cell stack **6** (see paragraph 25).

Nakao is silent to a valve opening sensor. However, it is the position of the examiner that a valve opening sensor is inherent, given that the controller **7** must operate the opening and closing of the regulator valve **2**. A reference which is silent about a claimed invention's features is inherently anticipatory if the missing feature is necessarily present in that which is described in the reference. Inherency is not established by probabilities or possibilities. See *In re Robertson*, 49 USPQ2d 1949 (1999).

7. Claims 11, 12, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Andreoli as applied to claims 1, 3-6, 9 and 10 above, and further in view of Fuglevand et al. (hereinafter "Fuglevand") (U.S. Pat. No. 6,096,449).

Regarding claims 11, 12, 24 and 25, Andreoli is silent to ammeter.

Fuglevand teaches a controller **122** which upon sensing, by way of current sensor **128** (ammeter), a given current output of a fuel cell **10**, adjusts a valve **104** into a predetermined fluid metering relationship relative to the supply of fuel gas **105** (see col. 7, lines 50-55; figure 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a current sensor in the fuel cell systems of Andreoli because Fuglevand teaches the use of a current sensor to maintain the effectiveness of the fuel cell.

8. Claims 11, 12, 24 and 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nakao and Epp as applied to claims 1, 3, 5-7 and 9 above, and further in view of Fuglevand et al. (hereinafter "Fuglevand") (U.S. Pat. No. 6,096,449).

Regarding claims 11, 12, 24 and 25, Nakao and Epp are silent to ammeter.

Fuglevand teaches a controller **122** which upon sensing, by way of current sensor **128** (ammeter), a given current output of a fuel cell **10**, adjusts a valve **104** into a predetermined fluid metering relationship relative to the supply of fuel gas **105** (see col. 7, lines 50-55; figure 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to have included a current sensor in the fuel cell systems of Nakao and Epp because Fuglevand teaches the use of a current sensor to maintain the effectiveness of the fuel cell.

Conclusion

9. Any inquiry concerning this communication or earlier communications from the examiner should be directed to STEPHAN ESSEX whose telephone number is (571) 270-7866. The examiner can normally be reached on Monday - Friday, 7:30-5:00 EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Dah-Wei Yuan can be reached on (571) 272-1295. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/SJE/

/Dah-Wei D. Yuan/
Supervisory Patent Examiner, Art Unit 1795